1. A method for maintaining cell viability in a microfluidic device, the method comprising the steps of:

providing a cell proximate a first side of a porous membrane of the microfluidic device; and

providing a media comprising a cell nutrient proximate a second side of the porous membrane, wherein the porous membrane is adapted to prevent the cell from passing therethrough, to substantially prevent the media from flowing therethrough, and to provide diffusive communication between the two sides to allow the cell nutrient and a cell product to pass therethrough.

2. The method of claim 1, further comprising the step of detecting the cell product in the media.

3. The method of claim 2, wherein detecting the cell product in the media comprises detecting at least one of an electrochemical signal and a luminescent emission.

4. The method of claim 1, wherein the porous membrane comprises a material selected from the group consisting of glass fiber, polycarbonate, polyethylene, polypropylene, polystyrene, polyimide, cellulose, nitrocellulose, cellulose esters, nylon, rayon, fluorocarbon, perfluorocarbon, polydimethylsioloxane, polyester, acrylics, acrylonitrile-butadiene- styrene; polyoxy-methylene; polyarylate, polyvinylchloride, PBT-polyester, polybenzimidazone, acetal copolymers, polyimides, ethylene-chlorotrifluorethylene, PET polyesters, ethylene-tetrafluorethylene, fluorinated ethylene propylene, polyphenylene sulfide, polyethylene, polyurathanes, polyketones, polychloro-trifluoro-ethylene, polyvinylidene fluoride, polyethylene terephthalate polyesters, polypropylene oxides, polypropylene styrenes, polyether-ether ketones, polytetrafluorethylene, polyarylether sulfones, polyamide-imides, polyphenylene sulfides, polyarylates, polymethylpentene, polyketones, polysulfones, polyphenylene sulfides, PBT polyesters, and/or alloys of polymers.

5. The method of claim 1, wherein the step of providing the media comprises flowing the media along at least a portion of the second side of the porous membrane.

6. The method of claim 5, wherein flowing the media comprises intermittently flowing the media.

7. The method of claim 1, further comprising the step of controlling a temperature of the cell.

8. The method of claim 1, further comprising the step of controlling a concentration of the cell nutrient in the media.

9. A method for loading cells into a microfluidic device, the method comprising the steps of:

depositing a cell sample into a common duct opening of the microfluidic device; and

subdividing the cell sample, so that at least a first portion of the sample flows into a first cell duct in fluidic communication with the duct opening and another portion of the sample flows into a second cell duct in fluidic communication with the duct opening.

10. The method of claim 9, wherein the step of subdividing the cell sample comprises flowing at least a portion of the cell sample through a manifold interdisposed between the duct opening and at least one cell duct.

11. The method of claim 9, wherein at least one of the sample portions flows by capillary action.

12. The method of claim 9, wherein the step of subdividing the cell sample comprises substantially uniformly dividing the cell sample.

13. The method of claim 9, wherein the step of subdividing the cell sample includes applying a pressure differential.

14. The method of claim 9, wherein the cell sample comprises a substantially isopycnic solution having a density substantially similar to a density of cells in the sample, such that the cells remain substantially in neutral suspension in the isopycnic solution.

15. A microfluidic device for maintaining viability of a cell, the device comprising:

a cell duct plate, defining at least one cell duct therein;

a porous membrane having a first side bounding at least a portion of the cell duct; and

a flow channel plate, defining at least one flow channel therein, at least a portion of the flow channel being bounded by a second side of the porous membrane, wherein the cell duct and the flow channel are in diffusive communication through the membrane and

the porous membrane is adapted to prevent a cell in the cell duct from passing therethrough, while allowing a cell nutrient in the flow channel and a cell product in the cell duct to pass therethrough.

16. The microfluidic device of claim 15, wherein the cell duct plate comprises a material selected from the group consisting of glass, fused silica, quartz, silicon, and organic polymers.

17. The microfluidic device of claim 15, wherein the flow channel plate comprises a material selected from the group consisting of glass, fused silica, quartz, silicon, and organic polymers.

18. The microfluidic device of claim 15, wherein the porous membrane comprises a material selected from the group consisting of glass fiber, polycarbonate, polyethylene, polypropylene, polystyrene, polyimide, cellulose, nitrocellulose, cellulose esters, nylon, rayon, fluorocarbons, perfluorocarbons, polydimethylsiloxane, polyester, acrylics, acrylonitrile-butadiene- styrene; polyoxy-methylene; polyarylate, polyvinylchloride, PBT-Polyester, polybenzimidazone, acetal copolymers, polyimides, ethylene-chlorotrifluorethylene, PET polyesters, ethylene-tetrafluorethylene, fluorinated ethylene propylene, polyphenylene sulfide, polyethylene, polyurathanes, polyketones, polychloro-trifluoro-ethylene, polyvinylidene fluoride, polyethylene terephthalate polyesters, polypropylene oxides, polypropylene styrenes, polyether-ether ketones, polytetrafluorethylene, polyarylether sulfones, polyamide-imides, polyphenylene sulfides, polyarylates, polymethylpentene, polyketones, polysulfones, polyphenylene sulfides, PBT polyesters, and alloys of polymers.

19. The microfluidic device of claim 15, wherein the porous membrane defines a pore size having a diameter selected from the range of about 1 nanometer to about 100 micrometers.

20. The microfluidic device of claim 15, wherein the porous membrane has a thickness less than about 200 microns.

21. The microfluidic device of claim 20, wherein the thickness is greater than about 5 microns.

22. The microfluidic device of claim 15, wherein the porous membrane comprises an interfacial layer disposed between the cell duct plate and the flow channel plate.

23. The microfluidic device of claim 15, further comprising a plurality of cell ducts in combination with a plurality of flow channels.

24. The microfluidic device of claim 23, wherein a number of cell ducts is equal to a number of flow channels.

25. The microfluidic device of claim 23, wherein the cell ducts are generally radially disposed about a common duct opening.

26. The microfluidic device of claim 23, wherein at least two flow channels are not in mixing fluidic communication with each other.

27. The microfluidic device of claim 23, wherein at least two flow channels are in mixing fluidic communication with each other.

28. The microfluidic device of claim 15, wherein at least one of a cell duct and a flow channel further comprises a valve.

29. A microfluidic device for retaining a cell sample including a plurality of cells, the device comprising:

a plate defining:

a common duct opening adapted to receive the cell sample; and

at least two cell ducts in fluidic communication with the duct opening, so that at least a portion of the cell sample can flow into a first cell duct and another portion of the cell sample can flow into a second cell duct.

30. The microfluidic device of claim 29, wherein the plate further defines a manifold interdisposed between the duct opening and at least one cell duct.

31. The microfluidic device of claim 29, further comprising a pressure differential source adapted to induce the flow of at least one of the cell sample portions into at least one of the cell ducts.

32. A system for monitoring an activity of a cell, the system comprising:

a microfluidic device comprising:

a cell duct plate defining at least one cell duct therein;

a porous membrane having a first side bounding at least a portion of the cell duct; and

a flow channel plate, defining at least one flow channel therein, at least a portion of the flow channel being bounded by a second side of the porous membrane,

wherein the porous membrane is adapted to prevent a cell in the cell duct from passing therethrough, while allowing a nutrient in the flow channel to pass therethrough and allowing a product of the cell to pass therethrough;

a pump adapted to induce flow of a nutrient media through the flow channel to support cell viability in the cell duct;

a controller adapted to control flow in the microfluidic device; and

a sensor adapted to detect at least one of the cell and the product of the cell.

33. The system of claim 32, wherein the sensor comprises at least one of an electrochemical detector and a luminescence detector.

34. The system of claim 33, wherein the luminescence detector comprises a fluorescent reagent, an excitation light source adapted to provide radiation having a first radiation wavelength range, and a detector adapted to measure an intensity of emitted light in a second radiation wavelength range, the second radiation wavelength range being different from the first radiation wavelength.

35. The system of claim 33, wherein the electrochemical detector comprises an electrode adapted to measure at least one of pH and dissolved oxygen.